

## Insulin Resistance in Children and Adolescents in Relation to Body Mass Index, Waist Circumference and Body Fat Weight

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**Abstract :** Aim: To investigate the relation and impact of Body Mass Index (BMI), Waist Circumference (WC) and Body Fat Weight (BFW) on insulin resistance (MATSUDA INDEX < 2.5) in children and adolescents. Methods: Data from 95 overweight and obese children (47 boys and 48 girls) with mean age  $10.7 \pm 2.2$  years were analyzed. ROC analysis was used to investigate the predictive ability of BMI, WC and BFW for insulin resistance and find the optimal cut-offs. The overall performance of the ROC analysis was quantified by computing area under the curve (AUC). Results: ROC curve analysis indicated that the optimal-cut off of WC for the prediction of insulin resistance was 97 cm with sensitivity equal to 75% and specificity equal to 73.1%. AUC was 0.78 (95% CI: 0.63-0.92,  $p=0.001$ ). The sensitivity and specificity of obesity for the discrimination of participants with insulin resistance from those without insulin resistance were equal to 58.3% and 75%, respectively (AUC=0.67). BFW had a borderline predictive ability for insulin resistance (AUC=0.58, 95% CI: 0.43-0.74,  $p=0.101$ ). The predictive ability of WC was equivalent with the correspondence predictive ability of BMI ( $p=0.891$ ). Obese subjects had 4.2 times greater odds for having insulin resistance (95% CI: 1.71-10.30,  $p < 0.001$ ), while subjects with WC more than 97 had 8.1 times greater odds for having insulin resistance (95% CI: 2.14-30.86,  $p=0.002$ ). Conclusion: BMI and WC are important clinical factors that have significant clinical relation with insulin resistance in children and adolescents. The cut off of 97 cm for WC can identify children with greater likelihood for insulin resistance.

**Keywords :** body fat weight, body mass index, insulin resistance, obese children, waist circumference

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